**Newton’s Second Law**

**Lesley Wright**

*Pre lab*

**Part A:** Determining the coefficient of kinetic friction

Materials:

Newton meter

Car

Ramp

Procedure:

1. Newton meter was hooked up to the back of the car
2. The car was pulled up the ramp at a constant velocity
3. The measurement on the Newton meter was recorded.

Results:

The Newton meter read 10 N.

Ff = μ \* FN

FN = Fg = m \* g

= (10kg) (9.81m/s2)

FN = 98.1 N

Therefore:

μ = Ff / FN

μ = 10 N / 98.1 N

μ = 0.1

Therefore the coefficient of friction is 0.1.

Analysis:

1. See Excel document
2. See Excel document
3. See Excel document, formula y = 20x -18.1. This means that it is a direct ratio of acceleration to net force, for every one more m/s/s, the net force increases by 20 N.
4. I couldn’t find a way to make this work, when the net force is constant. I assume it to be that since Force = mass \* acceleration, that if the net force is the same, then the mass and acceleration must be inversely proportioned
5. This slope represents the inverse of the equation F = m\*a, since we are calculating the slope with 1/m.
6. F = m \* a
7. Errors include varying weights (not accurate 100%), coefficient of friction against the string and the pulley, starting car at different points on the ramp.

Conclusion:

From this experiment I have derived the formula F = m\*a, which shows the relationship between the mass of the car and the acceleration of gravity, as well as the mass of the weight added to different parts of the car, and the acceleration this provides.

The purpose statement was that there is a relationship betwee F net = m \* a, and through the experiement, it was discovered that F = m\*a.